SOLVAY

May 2, 2016

VIA EMAIL (wilwerding.joe@epa.gov)
and FEDERAL EXPRESS

Joe Wilwerding
U.S. Environmental Protection Agency, Region 8
Technical Enforcement Program
Office of Enforcement, Compliance and Environmental Justice
1595 Wynkoop Street
Denver, CO 80202-1129

Re: Solvay Third Response to 2016 Request

Dear Mr. Wilwerding:

This letter, and responsive documents on the enclosed USB flash drive, is the third and final response to the January 25, 2016 Follow-up Section 114(a) Information Request ("2016 Request") to Solvay Chemicals Inc. ("Solvay") from the U.S. Environmental Protection Agency ("EPA"). Solvay previously provided information responsive to items #3, #5, #9, and #10 of the 2016 Request on March 2, 2016 ("2016 First Response)" and information responsive to items #2, #7, and #8 on April 1, 2016 ("2016 Second Response"). EPA requested, in a letter received on March 8, 2016 by Holland & Hart, Solvay's outside counsel, for Solvay to provide the following responsive information by May 2, 2016:

- #6 (backup reports for VOC/HAPs emission tests on the calciners);
- #1 (documents responsive to 2014 Requests No. 6 and No. 7 for the: Gas Efficiency Project; CA-2 Bucket Elevator Project; Calciner Conversion from Gas to Coal Project; and Star Strike II which includes the projects identified as CA-3 Bucket Elevator, Upgrade Calciner Discharge and Upgrade CA-1 Discharge, CA-1 Bucket Elevator, and CA-1 Upgrade, and is consistent with 2016 Request #4);
- with respect to the Gas Boiler Addition, documents responsive to 2014 Requests No. 3, No. 4, No. 5, No. 6, No. 7 and No. 11 (including NO_x and CO);

- #11 (monthly average wet and dry volume of process gas vented from each calciner); and

- update of 2014 Requests #4 (capital projects) and #5 (AFEs for capital projects);

Each response below is preceded by a copy of the question from the 2016 Request (or the EPA letter granting the extension request) to which it responds.

For ease of review, Solvay provides information in the following order: 2016 Request #6, 2016 Request #11, update of 2014 Requests #4 and #5, 2016 Request #1, and other requested information about the Gas Boiler Addition. With respect to 2016 Request #1, the information is provided on a project by project basis. Solvay is providing responsive documents on the enclosed USB flash drive and has identified documents responsive to each request by Bates number.

This response includes **Confidential Business Information** ("CBI") and the responsive documents that include such information have been labeled "CONFIDENTIAL BUSINESS INFORMATION." They are separated by folders labeled "CBI" on the enclosed USB flash drive. Consistent with Enclosure 4 of the April 28, 2014 Request under Section 114(a) of the Clean Air Act ("2014 Request"), Solvay has answered the questions necessary to assert a claim of business confidentiality for this information in a separate letter to Lauren Hammond.

As detailed in its July 7, 2014 Response to the 2014 Request, this response incorporates Solvay's General Objections and Objections to Definitions in the 2014 Request and 2016 Request. Without waiving or limiting these objections, Solvay has attempted to respond to the 2016 Request as completely and accurately as possible based on the information presently available.

SOLVAY'S RESPONSES TO REQUEST FOR INFORMATION

- **Request #6:** *In Solvay's response to item 8 of the 2014 Request, Solvay stated, "Consistent with a conversation between Solvay's outside counsel and Mr. Buenning of EPA, and as confirmed by email on May 22, 2014, Solvay is only providing the results of the testing at this time and not the backup reports accompanying the results. If EPA would like to see any of the backup reports, they will be provided in a timely manner." [SOLVAY_000010]. Please provide the backup reports.*

Item 8 of the 2014 Request asked Solvay to provide testing information on volatile organic compound ("VOC") and hazardous air pollutant ("HAP") emissions from the calciners, along with any contemporaneous ore sample results. In its July 7, 2014 response to the 2014 Request, Solvay provided the results of the VOC and HAP tests performed on the calciners, along with the ore sample results, at Bates No.

SOLVAY8_000001 – SOLVAY8_000084. The backup reports for the VOC and HAP tests can be found in the folder labeled "2016 Request #6" on the enclosed USB flash drive.[1] In its 2016 Second Response to 2016 Request #7, Solvay provided the summary pages for three VOC tests which had been incorrectly identified in the July 7, 2014 response as being responsive to 2014 Request No. 9 (other air pollutant measurements on the calciners) but were actually responsive to 2014 Request No. 8.[2] In this response, Solvay is providing the entire report for those VOC tests including the summary pages previously provided.

To assist EPA's review, Solvay provides a summary table that lists the VOC/HAP tests in chronological order and any contemporaneous ore sample test results, along with the Bates Nos. for the full backup reports and the Bates Nos. of the contemporaneous ore sample test results which Solvay provided in response to 2014 Request No. 8.[3] Contemporaneous ore sample test results from a third party lab were found for some of the days in January 1995 and April 1995 where VOC/HAP tests were conducted on CA-1, CA-2, and CA-3. For some of the other VOC/HAP tests, Solvay has been able to locate ore sample analyses conducted at Solvay's on-site laboratory on or near to the dates of the stack tests. However, despite its extensive search of Solvay's internal quality control databank, Solvay has been unable to locate contemporaneous ore sample analyses for all of the VOC/HAP tests. The ore sample analyses are part of Solvay's standard operating procedures for ensuring optimal operation of the calciners. The ore samples were not taken, and the tests were not conducted, for any purpose related to the VOC/HAP tests which happened to be occurring on or about the same time at the Facility. For the ore sample analyses conducted at Solvay's on-site laboratory which Solvay is producing, Solvay asserts the analyses are **Confidential Business Information.** These ore samples can be found in the folder labeled "CBI 2016 Request #6" on the enclosed USB flash drive.[4]

- **Request #11:** *Provide, in electronic format (Excel or other comma delimited format), for each individual calciner, from 1995 to present, the monthly average wet and dry volume of process gas vented from each calciner to the atmosphere.*

Solvay does not track the monthly average wet and dry volume of process gas vented from each calciner. This data is not required under any of Solvay's permits.

For the CA-1/CA-2 stack, however, it is possible for Solvay to calculate an average monthly stack flow using the CEMS data Solvay records for purposes of calculating its rolling 30-day average nitrogen oxide ("NO_x") emissions as required by

[1] SOLVAY2016_6_000004 – SOLVAY2016_6_002683.
[2] SOLVAY2016_7_0000133 – SOLVAY2016_7_000148.
[3] SOLVAY2016_6_000001 – SOLVAY2016_6_000004. In a few instances, there may be a discrepancy between the date a sample was taken for testing and the date listed in the 2014 Request No. 8 which was the report date.

(b) (4) [redacted]

Solvay's Title V permits. Solvay has three CEMS analyzers on the CA-1/CA-2 stack which monitor and measure NO_x and oxygen (O_2) emissions on an undiluted wet and dry basis, along with two stack flow monitors.[5] The data from the three CEMS analyzers and the two stack flow monitors provide the inputs for a series of EPA equations programmed into the CEMS that calculates the 30-day rolling average NO_x emissions.

While it is not the reason Solvay gathers this information, Solvay realized that this CEMS data may be used to calculate a monthly average stack flow based on the monthly average percentage dry O_2 and monthly average percentage wet O_2 along with the average daily stack flow. The average monthly stack flow is represented in a thousand dry standard cubic foot per hour ("Kdscfh"). The CEMS data for the CA-1/CA-2 stack measuring the monthly average percentage dry O_2 and monthly average percentage wet O_2, along with this calculated monthly average stack flow, is attached and labeled "2016 Request #11."[6] Since the CEMS data is regularly overwritten, the CEMS data for the CA-1/CA-2 stack is only available since August 2012. Because the CEMS is associated with a common stack, it is impossible to provide this data specifically for CA-1 and CA-2.

For CA-3 and CA-4, Solvay only has stack flow information for the days when stack tests were performed on either calciner. The summary pages for these stack tests were provided by Solvay in the 2016 Second Response to 2016 Request #7 and in this 2016 Third Response to 2016 Request #6. In the reports, the stack flow volume is provided in Actual Cubic Feet per Minute ("acfm"), Standard Cubic Feet per Minute ("scfm") or Dry Standard Cubic Feet per Minute ("dscfm"). Solvay does not have monthly average stack flow data for either CA-3 or CA-4 as there is no CEMS or other instrumentation on either calciner which could potentially provide the inputs necessary for such a calculation.

- **Update 2014 Request No. 4 / 2014 Request No. 5.**

The letter granting Solvay's request for additional time to respond to the 2016 Request asks Solvay to update the information provided in response to the 2014 Requests No. 4 and No. 5, "including the coal-fired boilers as well as the calciners". There have been no capital projects at the Facility since Solvay prepared its response to the 2014 Request on the calciners or the coal-fired boilers.

However, in light of EPA's continued questions about the capital projects performed on the coal-fired boilers at the Facility, Solvay wants to explain to EPA both the role of boilers at the Facility and how Solvay maintains the boilers.

[5] The CEMS on the CA-1/CA-2 stack also has a fourth analyzer to monitor and measure opacity.
[6] SOLVAY2016_11_000001.

Boiler Operations. In 1982, the previous owner of the Facility (Tenneco) began soda ash refining and processing operations at the Facility. This refining process, which produces marketable soda ash from the trona ore mined at the site, has not significantly changed in the intervening decades. Some parts of this process rely heavily on steam, which Solvay generates via two coal-fired boilers and one gas-fired boiler. These boilers do not generate electricity.

The first step in the soda ash production process is crushing and sizing the mined trona, and heating the ore in a furnace/direct-fired rotary kiln to burn off carbon dioxide and water and produce crude soda ash. These kilns use either coal or natural gas and do not rely on the boilers for power. Particulate matter emissions resulting from the calcining process, including both combustion emissions and process emissions, are controlled via electrostatic precipitators. Second, the crude soda ash is dissolved to create a solution of sodium carbonate (also known as soda ash liquor) that travels through a series of settling, filtering and thickening steps to separate out insoluble particles. Third, the soda ash liquor is steam heated in the evaporators (also known as crystallizers) to drive off any remaining excess water and produce soda ash crystals. Solvay uses the original steam heated triple-effect evaporator and four Mechanical Vapor Recompressors for the crystallization stage. Fourth, the wet soda ash crystals are dewatered in a centrifuge and then sent to dryers to drive off the remaining moisture in the crystals. The evaporation, crystallization and two of the four dryers, along with some ancillary equipment, use the steam generated by the boilers. Finally, the resulting granular soda ash product undergoes screening prior to packaging and shipping. Steam is also used in the sulfite and bicarbonate processes either for evaporation or drying of the finished product.

Until 2015, when the gas fired boiler became operational, Solvay relied exclusively on two coal-fired boilers at the Facility to produce all the steam needed. As noted earlier, the boilers do not produce electricity. All electricity used at the Facility is purchased from Rocky Mountain Power.

The original design capacity of each coal-fired boiler was 300,000 pounds of steam per hour. The capacity of each coal-fired boiler has not changed over the life of the boilers, and the current capacity of each coal-fired boiler remains at 300,000 pounds of steam per hour. And, the annual operating hours and coal consumption of each boiler have remained constant over the boilers' operational life.

Solvay's boilers operate only at lower pressures (300 pounds steam and 35 pounds steam), so the wear and tear on the systems is much less than in a higher-pressure system. To maintain consistent production of steam year-after-year, Solvay performs regular maintenance work on the boilers. This boiler maintenance is performed during scheduled outages at the Facility and is undertaken to maintain the coal feeders, grates, precipitators, scrubbers, as well as to perform maintenance based on inspections done during regular work outages. This maintenance may also include the application of a ceramic coating to the generating tubes to prevent erosion and

reduce tube maintenance. This coating is inspected annually and reapplied about every other year. Solvay has never done a retube on either boiler.

The coal-fired boilers historically produced sufficient steam for the processing operations at the Facility and have enabled some soda ash production increases. The production increases that have occurred have been accomplished without a need for additional steam as a result of the installation of four Mechanical Vapor Recompression ("MVR") crystallizers. The MVR crystallizers use significantly less steam per ton than the triple-effect crystallizer, so soda ash production rates could increase while requiring less steam per ton.

When the boilers are shut down for maintenance and not providing steam, the soda ash processing operations necessarily produce less soda ash. Because of this constraint, Solvay recently obtained a PSD permit and installed a gas-fired boiler at the Facility that produces 200,000 pounds of steam per hour. The gas-fired boiler also provides Solvay with flexibility with respect to the fuel it uses for steam generation. More significantly, this additional steam will be used to keep the crystallizers and steam tube dryers operating when a coal-fired boiler is shut down for maintenance, which allows the Facility to maintain soda ash production levels.

Boiler Maintenance Cost Classification. Solvay classifies all costs associated with the maintenance of the coal-fired boilers as operating expenses, including the purchase of like-like equipment for individual parts of the boiler (i.e., the hoppers) or planned maintenance on boiler parts (i.e., coating of the tubes). Because these costs are operating expenses, they are included in the operating budget for the Facility. They are not considered capital expenses, which would require additional authorization within Solvay and would be eligible for depreciation.

Solvay is aware of one instance where a maintenance project on the coal-fired boilers was reclassified by Solvay's accounting department from an operating expense to a capital expense. Each year, during the shut-down of the boilers, Solvay inspects the grates and makes any necessary repairs or replaces portions of the grates with like-like equipment if appropriate. In 2013, because of increased failures of the boiler grates, Solvay had to replace larger sections of the grates in BO-1 and BO-2 than usual. Consistent with Solvay's process for handling the costs of maintenance projects on the boilers, the costs for the replacement grates were included in the operating budget for the Facility. However, at some point after the grate replacement project was completed, Solvay's accounting department moved the costs for the project from the operating budget to the capital budget at the Facility so that the grate replacement costs could be capitalized. Nevertheless, Solvay does not consider the project to be a capital project under the Section 114 Request and did not identify the project in its response to 2014 Request No. 4.

As Solvay has previously noted, the 2014 Request did not contain a definition of "capital project" so Solvay interpreted the term to be identical to "capital improvement

project request." A "capital improvement project request" is defined to be documents that describe projects:

> for *equipment and process changes* when seeking management approval for a planned expenditure at the facility. These documents are also known as capital appropriation requests, *authorizations for expenditure*, work order records, improvement requisition projects, or other similar names.

In the case of the 2013 grate replacement project, the new grates were like-like equipment. They did not, in any way, change the operation of either boiler or increase a boiler's capacity to produce steam. Rather, like all maintenance projects on the coal-fired boilers, replacement of the grates helped preserve the mechanical integrity of the boiler until the next scheduled outage and allowed Solvay to maintain the status quo with respect to steam production for the coming year. Moreover, since replacing the grates was considered maintenance, the costs associated with the project were classified as operating expenses (until reclassified by the accounting department) and no authorization for expenditure was ever prepared.

- ***Request #1:*** *The EPA has reviewed the list of capital projects provided by Solvay in its previous responses, and has identified a narrowed list of projects. Please provide all related documents that support Solvay's response to questions 6 and 7 of the 2014 Request. The identified list of projects are as follows:*

Project Name	Bates/File Number(s)
CA-2 Bucket Elevator	SOLVAY5_CBI_000006-SOLVAY5_CBI_000006
Calciner Conversion to Coal	SOLVAY5_CBI_000008-SOLVAY5_CBI_000008
[redacted]	
Gas Efficiency	SOLVAY5_CBI_000018-SOLVAY5_CBI_000018
[redacted]	
[redacted]	

[redacted]	
Gas Boiler Addition	This project was not listed in the Solvay 114 response, but was listed in a PSD permit (PSD-WY-000004-2012.001) for the site.

The six highlighted capital projects are part of the Star Strike 2 Project which included the: (1) CA-3 Bucket Elevator (SOLVAY5_CBI_000019-SOLVAY5_CBI_000020); (2) CA-1 Bucket Elevator (SOLVAY5_CBI_000021-SOLVAY5_CBI_000024); and (3) CA-1 Fan Upgrade (SOLVAY5_CBI_000025-SOLVAY5_CBI_000027). Solvay has provided the documents relating to the listed capital project and which are responsive to 2014 Requests No. 6 and No. 7 in separate folders on the enclosed USB flash drive. Pursuant to a February 24 conversation and email exchange with Holland & Hart, Solvay is not providing documents responsive to 2014 Requests No. 6 g) (all requests for proposals and price quotations submitted by equipment suppliers or contractors) or No. 6 h) (all purchase orders and/or contracts for the project). Documents considered confidential business information are provided in separate folders labeled "CBI". The projects are ordered and numbered as follows:

1.1 CA-2 Bucket Elevator
1.2 Gas Boiler Addition (which includes additional responses for 2014 Request Nos. 3, 4, 5, and 11).
1.3 Calciner Conversion to Coal
1.4 Star Strike 2
1.5 Gas Efficiency

This response includes documents containing emission calculations associated BACT determinations and computer modeling performed for those projects which went through the Prevention of Significant Deterioration ("PSD") permitting process. Solvay is not producing the raw data input files used for modeling for the Gas Boiler Addition and Calciner Conversion to Coal projects, which Solvay possesses but cannot access because the contractors used their own modeling software.

- ***1.1 CA-2 Bucket Elevator***

Documents relating to the CA-2 Bucket Elevator and responsive to 2014 Requests No. 6 and No. 7 can be found in the folder labeled "1.1 CA-2 Bucket Elevator Req. 6"[7] and "1.1 CA-2 Bucket Elevator Req. 7."[8] Responsive documents containing **Confidential Business Information** can be found in the folders labeled [redacted] (b) (4)

[redacted] (b) (4)

[7] SOLVAY2016_1.1_000001 - SOLVAY2016_1.1 _000012.
[8] SOLVAY2016_1.1_0000013 - SOLVAY2016_1.1_000024

[redacted] (b) (4)

- ***1.2 Gas Boiler Addition*** ***(documents responsive to 2014 Request No. 3, No. 4, No. 5, No. 6, No. 7 and No. 11)***

(b) (4) [redacted]

(b) (4) [redacted]

- ***1.3 Calciner Conversion to Coal***

Documents relating to the Calciner Conversion to Coal Project and responsive to 2014 Requests No. 6 and No. 7 can be found in the subfolders labeled "1.3 Calciner Conversion to Coal Req. 6"[16] and "1.3 Calciner Conversion to Coal Req. 7"[17] on the enclosed USB flash drive. (b) (4) [redacted]

(b) (4) [redacted]

[10] SOLVAY2016_1.2_000001.

(b) (4) [redacted]

[12] SOLVAY2016_1.2_000002 – SOLVAY2016_1.2_004269; SOLVAY2016_1.2_004272 – SOLVAY2016_1.2_004777.

(b) (4) [redacted]

[15] SOLVAY2016_1.2_004270 – SOLVAY2016_1.2_004271.

[16] SOLVAY2016_1.3_000001 – SOLVAY2016_1.3_000153; SOLVAY2016_1.3_001118 – SOLVAY2016_1.3_001143.

[17] SOLVAY2016_1.3_000154 – SOLVAY2016_1.3_001117; SOLVAY2016_1.3_00144 – SOLVAY2016_1.3_001753.

(b) (4) [redacted]

- ***1.4 Star Strike 2***

Documents relating to the Star Strike 2 Project and responsive to 2014 Requests No. 6 and No. 7 can be found in the subfolders labeled "1.4 Star Strike 2 Req. 6"[20] and "1.4 Star Strike 2 Req. 7."[21] Some of the responsive documents contain **Confidential**

(b) (4) [redacted]

- ***1.5 Gas Efficiency***

In response to 2014 Request No. 5, Solvay included an Authority for Expenditure

(b) (4) [redacted]

* * * * *

Please direct any questions or concerns about this response to Kelly A. Johnson, Solvay's outside counsel, at (202) 654-6933, or kajohnson@hollandhart.com.

Sincerely,

Todd Brichacek
Senior Vice President & Site Manager
Green River Operations

Enclosure

cc: Lauren Hammond, R8ENF-L
Carlos Escobar, Solvay
Jeffrey Lang, Solvay
Kelly A. Johnson, Holland & Hart

[20] SOLVAY2016_1.4_000001 – SOLVAY2016_1.4_000005.

(b) (4) [redacted]

STATEMENT OF CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Todd Brichacek
Senior Vice President & Site Manager
Green River Operations

8745973_2